RTS

Innovating the Future of Global Communications

Modular Series (MH) Headsets and Headphones User Instructions

Models Include:

MH-300
MH-300L
MH-302
MH-302L
MH-402
MH-402L

PROPRIETARY NOTICE

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For warranty and service information, refer to the appropriate web site below:

RTS ..... www.rtsintercoms.com/warranty

RTSTW ..... www.rtstw.com/warranty

AudioCom .....www.telexaudiocom.com/warranty

RadioCom..... www.telexradiocom.com/warranty

Headsets..... www.intercomheadsets.com/warranty

REGULATORY INFORMATION

FCC

FC	This device complies with part 15 of the FCC Rules. Operation is subject to the following two (2) conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CE

CE	This product meets Electromagnetic Compatibility Directive 2004/108/EC

LIMIT LEVELING

The MH series headset and headphones are audio level limited and conform to the EU Council Directive 2003/10/EC. The time/weighted average of noise exposure levels for a nominal 8-hour working day is not expected to exceed 85dB SPL and a peak of 137dB SPL.

Available MH Series Accessories

Ear Cushion	F01U149725
Dynamic Microphone Windscreen	F01U149727
Headband Pad	F01U149729
Battery	F01U149731
Battery Charger North America	F01U149733
World Power Supply Adapters	F01U149735
Aux Audio Input Module	F01U149737
Single-Sided Passive Headset Frame Assembly	F01U149739
Double-Sided Passive Headset Frame Assembly	F01U149741
Analog ANR Headset Frame Assembly	F01U149743
Dynamic Microphone Module, Quick Disconnect Connector	F01U149745
Cable, Quick Disconnect to A4M Connector	F01U149747
Cable, Quick Disconnect to A4F Connector	F01U149749
Cable, Quick Disconnect to A5M Connector	F01U149751
Cable, Quick Disconnect to A5F Connector	F01U149753
Cable, Quick Disconnect to Pigtail	F01U149755
Filler Module	F01U149757
Temple Pad	F01U149759
Carrying Case	F01U149761
Dynamic Microphone Module, A4M Connector	F01U167564
Dynamic Microphone Module, A4F Connector	F01U167565
Dynamic Microphone Module, A5M Connector	F01U167566
Dynamic Microphone Module, A5F Connector	F01U167567
Dynamic Microphone Module, Pigtail	F01U167568
Headpad, 3-piece	F01U217632

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CHAPTER 1

Introduction

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. This headset is capable of producing sound pressure levels in excess of 100dB SPL.
6. Refer all servicing to qualified service personnel. Servicing is required when the headset is damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled into the headset, the headset is exposed to rain or moisture, or does not operate normally.
7. The battery used with these headsets is a Lithium based unit. This unit must only be charged with the RTS specified battery charger. Care should be used when storing the battery; ensuring the terminals are not shorted together.

General Description

The MH Series Headsets and Headphones provide the newest design in headset technology from RTS. With its rugged modular design, lightweight construction, installation options, and its multi-function use beyond the live studio or theater venue, the MH Series Headsets are designed with you, the user, in mind. The modular design allows you to interchange different modules to customize the best headset for your environment. The noise-canceling microphone, combined with the headphone transducers and **ANR** (Active Noise Reduction) provides clear and precise communication in noisy environments. Finally, this headset is not limited to live studio or venue communication. By installing the auxiliary audio input module, you can connect to an MP3 player, and many other audio devices.

The MH Series Headsets and Headphones provide clear communication for professional applications, including live remote or studio broadcasting, film, TV, and theater intercom communications.

TERMINOLOGY:	In this manual, a **Headset** refers to a device you wear on your head that allows you to both listen and speak. A headset always has a microphone. **Headphones** are an audio only device you wear on you head that allows you to listen only.

Features

Three (3) Headset Frame Options - The MH Series gives you three (3) options when selecting the type of headset for your environment:

- Single-Sided Headset without ANR (model MH-300 and MH-300L)
- Dual-Sided Headset without ANR (model MH-302 and MH-302L
- Dual-Sided Headset with ANR (model MH-402 and MH-402L)

Cord Termination - The MH Series Headset and Headphone is available with multiple cord termination configurations; 4-pin XLR male and female, 5-pin XLR male and female, pigtail, quick disconnect, and 3.5mm plug (with the Auxiliary Audio Module). The quick disconnect option allows for quickly terminating your headset to 4- and 5-pin XLR connectors (male and female) and to a pigtail cord end to meet the needs of the headset or headphone application.

Modular Design - The modular design of the MH Series allows for many options when configuring the perfect headset for use in your specific environment. All the modules are universal which means they are fully interchangeable, and giving you more flexibility in your headset needs. The versatility of the MH Dual-Sided Series is obvious when using the music/audio module. Installing the auxiliary audio module turns the broadcast headset into an every day, every where headset, allowing for MP3 player hookup, GPS connection, and many other applications.

Acoustic Performance - Expanded frequency response ensures clear communications and enhanced audio performance. The adjustable output level allows the user to match the headset to the requirements of the surrounding environment. Acoustic design and active noise reduction, available with the MH-402/402L, combine to remove common environmental noises.

Comfortable Design - The design of the MH Series headset with its headband location in relation to the ear cups delivers more stability when the headset is being worn. All user contact points, ear cup cushions, temple pads, headband cushions, and the windscreen are completely replaceable allowing for good hygiene.

MH-300/MH-300L (no ANR)
Single-Sided Headset/Headphone

FIGURE 11. Models MH-300 and MH-300L

NOTE: The MH-300L is a listen-only headphone. It does not have a microphone.

1. Headset Frame
2. Microphone Module or Auxiliary Audio Input Module
3. Temple Pad
4. Headband Pad
5. Ear Cushion
6. Windscreen
7. Side Cushions

MH-302/MH-302L (no ANR) & MH-402/MH-402L (ANR capable)
Dual-Sided Headset/Headphone

FIGURE 12. Models MH-302, MH-302L, MH-402, and MH-402L

NOTE: The MH-302L and the MH-402L are listen-only headphones. They do not have a microphone.

1. Headset Frame
2. Microphone Module or Auxiliary Audio Input Module
3. Headband Pad
4. Ear Cushion
5. Filler Module or Battery Module
6. Windscreen
7. Side Cushions
8. ANR Switch (MH-402/402L versions only)

NOTE: The switch label is used to determine the on and off position for ANR.

Battery Charger

NOTE: For more information, see “Battery Module” on page 21.

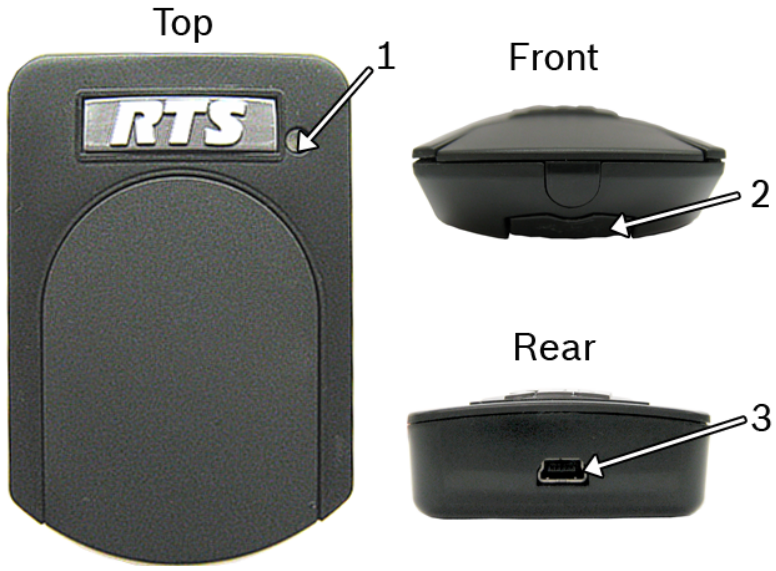


FIGURE 13. Battery Charger Reference Diagram

1. Operation LED
2. Module Release Button
3. Power Supply Connector

Battery Charger Power Supply

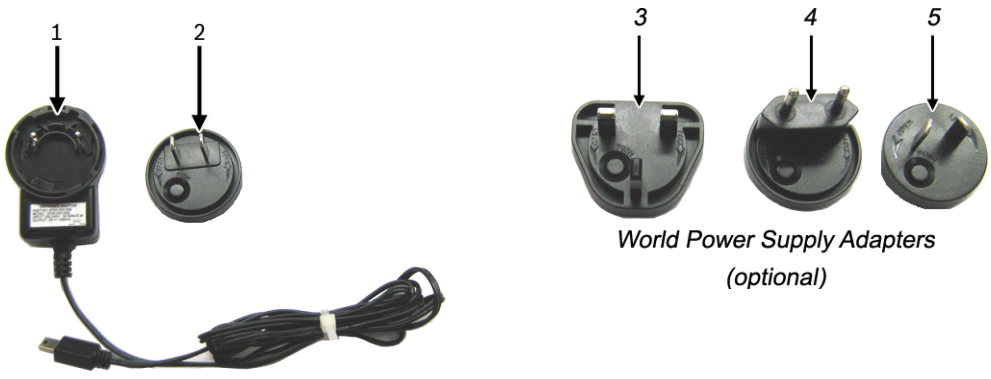


FIGURE 14. Standard Power Supply and Plug Adapters

Standard Power Supply[a]

1. Wall Pack
2. US Plug (standard)

World Power Supply Adapters (Optional - P/N PRD000260005)

3. UK Plug (optional)
4. Euro Plug (optional)
5. Australian Plug (optional)

a. The MH-402 and MH-402L come standard with the AC Adapter kit which includes all of the above options (P/N EML000012001)

CHAPTER 2

Configuration, Operation and Maintenance

The MH Series Headsets and Headphones were designed for use in multiple applications. As such, when using the headsets and headphones specific for you application, refer to the following sections to verify the proper configuration and settings.

Before First Use

Battery Charging (MH-402 Series)

For information on charging the battery, see “Charge the Battery” on page 22.

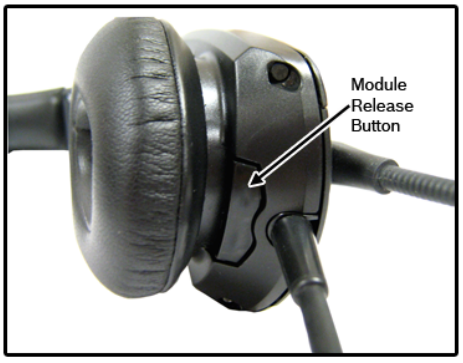
Battery Installation (MH-402 Series)

For information on installing the battery, see “Battery Module” on page 21.

Remove and Replace any Headset Module

To **remove a module**, do the following:

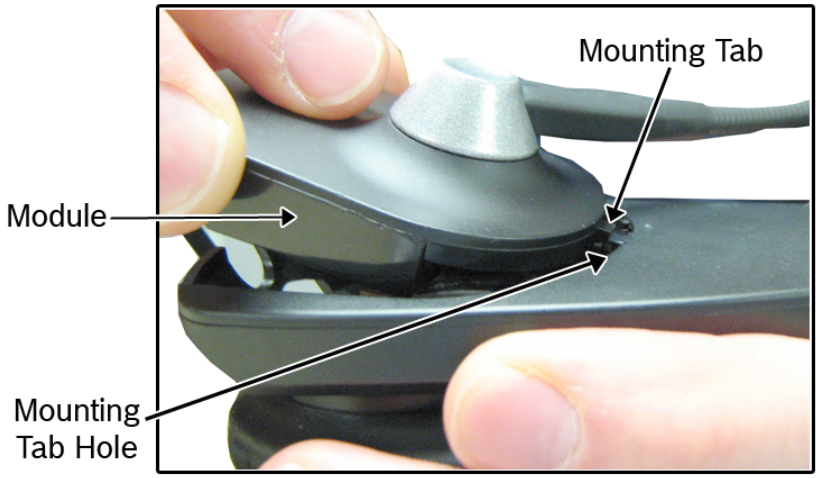
1. Press the **module release button** located at the bottom of the ear cup.
   The module pops up from the ear cup.



2. Slide the **module** out and up taking care to clear the mounting tab from the mounting tab hole.

To **replace a module**, do the following:

1. Align the **mounting tab** with the mounting tab hole.



2. Slide the **module** into place.
3. Press the **module** down, snapping it into the ear cup.

Configuration

NOTE: The MH Series headset and headphones have been configured for use in the most common applications. We recommend the configuration not be changed unless absolutely necessary.

The following information details configuration settings for:

- Speaker Volume (see “Configure the Speaker Volume” on page 12)
- Speaker Mode (see “Configure Speaker Mode” on page 13)
- ANR Mode (see “Configure ANR (MH-402 and MH-402L Only)” on page 14)
- Auxiliary Audio (see “Configure Auxiliary Audio” on page 14)

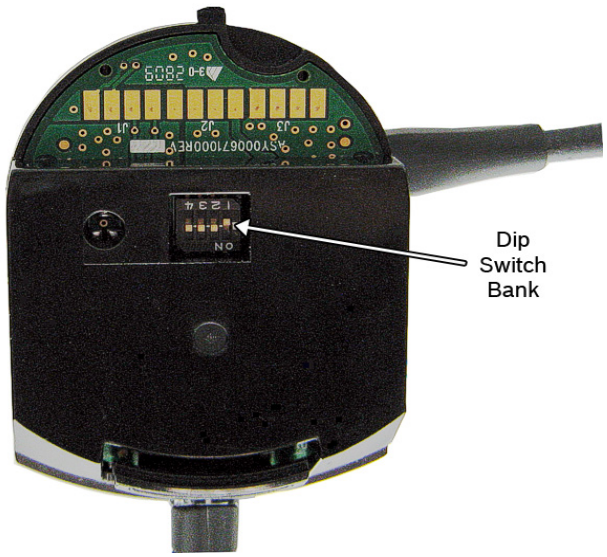
Access the Dip Switches

The speaker volume or the speaker mode of your headset is configured using a series of dip switches located on the side of the microphone module or listen-only module.

To **access the dip switches**, do the following:

NOTE: Dip switches are located on the microphone module and the listen-only module. This feature is not available on the audio input module.

1. Remove the **microphone module** or **listen-only module**.
2. Locate the **dip switch bank** on the side of either the microphone module or the listen-only module.



Configure the Speaker Volume

Speaker Volume is configured using dip switch settings located on the microphone module and the listen-only module.

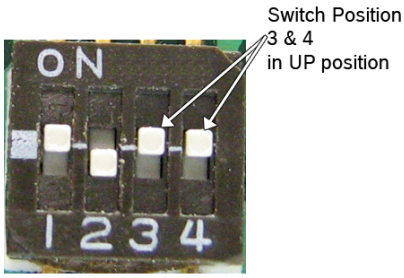
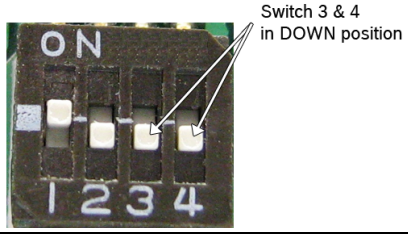
To **adjust the speaker volume**, do the following:

> Using a small flathead screwdriver (or other device), adjust the **speaker volume**. See Table 1.

Dip Switch Settings

NOTE: Only switch positions 3 and 4 are used to configure speaker volume.

TABLE 1. Speaker Volume Dip Switch Settings

Dip Switch	Description
	**Reduced Volume (-10dB from Normal Volume)**
	**Normal Volume (Default)**

Configure Speaker Mode

Audio on the headset can be configured to be heard either Mono, Left Only, or Stereo. This means it can come from both sides of the headset or from the left side only.

NOTE: The stereo option can only be used with the 5-pin XLR connector versions.

This configuration is done through setting dip switches located on the main board of the headset.

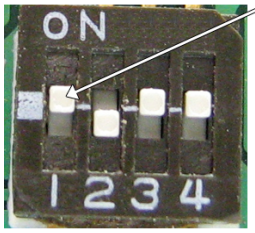
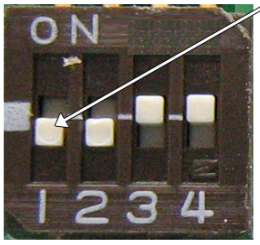
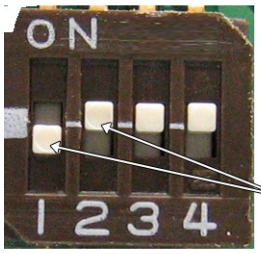
NOTE: To access the Dip Switches, see “Access the Dip Switches” on page 11.

To **configure speaker mode**, do the following:

> Using a small flathead screwdriver (or other device), set the **dip switches** to the mode of operation desired. See Table 2.

Dip Switch Settings

TABLE 2. Mono, Stereo, or Left Only Dip Switch Settings

Dip Switch	Description
	**Mono Mode (Default)**
	**Left Only Mode**
	**Stereo Mode** **NOTE:** Any module using A5M or A5F connectors has stereo capabilities.

Configure ANR (MH-402 and MH-402L Only)

ANR is used to reduce unwanted noise in the headset from the surrounding environment. The ANR switch is located on the left ear cup, as seen in Figure 15.

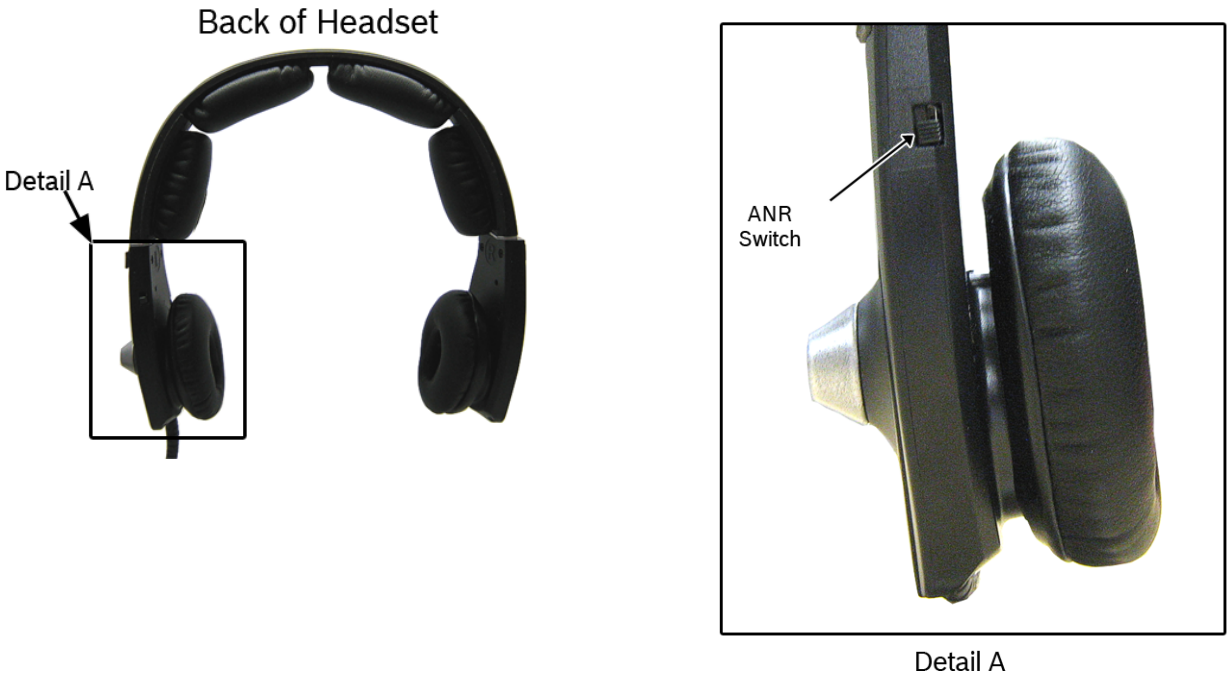


FIGURE 15. ANR Switch

To **turn ANR on**, do the following:

> On the left ear cup, move the **ANR switch** to the up position.

To **turn ANR off**, do the following:

1. On the left ear cup, move the **ANR switch** to the down position.
2. Remove **battery**, if applicable, to conserve battery power.

Configure Auxiliary Audio

The MH Series headset can also be used to listen to music, GPS information, etc.

To **use the MH Series headset for audio input**, do the following:

NOTE: The battery module is only needed when you want to use the ANR feature of the MH-402 or MH 402L.

Step 1 If necessary, install the **battery module** into the headset. See “Battery Module” on page 21.

Step 2 Install the **audio input module**.

Step 3 Adjust the **headset** for proper fit and comfort. See “Headset Adjustment and Sizing” on page 15.

Operation and Maintenance

To **operate the MH Series headset**, do the following:

Step 1 Adjust the **headset** for proper fit and comfort. See “Headset Adjustment and Sizing” on page 15.

Step 2 Adjust the **microphone** for proper use.

Step 3 Turn on **ANR**. See “Configure ANR (MH-402 and MH-402L Only)” on page 14.

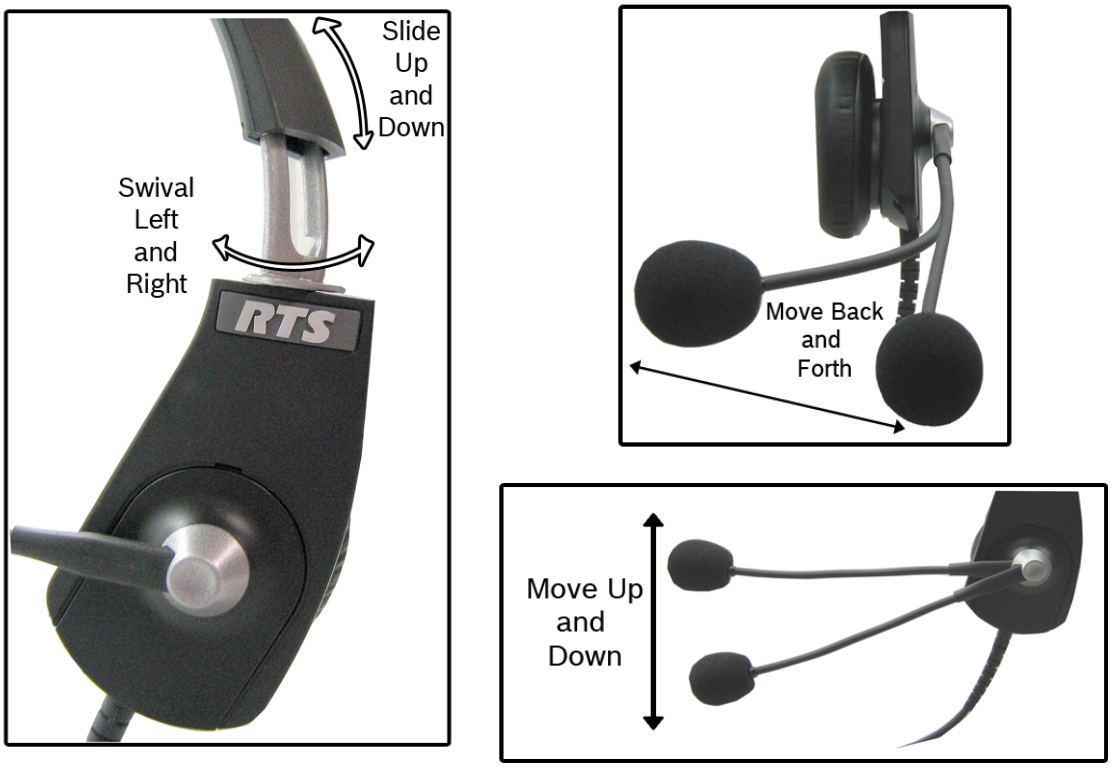
Step 4 Plug the **headset** in.

Headset Adjustment and Sizing

The headset should fit comfortably over the head and ears without pinching or gapping. A comfortable fit is conducive to effective and pleasant use.

To **adjust the headband size**, do the following:

1. With the headset resting securely on the top of the head, slide the **ear cup up and down** to center the ear cup over the ear.
2. Swivel the **ear cup left or right** to position the ear cup flat on the ear.



Microphone Adjustment

From the factory, the microphone is installed on the left side of the headset. However, you can interchange the microphone for right-side use, see “Remove and Replace any Headset Module” on page 9.

Replace the Earcup, Temple and Headband Cushion

There are three (3) cushion replacement points on the MH Series Headset; ear cups, temple pads, and the headband.

The MH-302/302L and the MH-402/402L have two (2) ear cup cushions and a headband cushion, while the MH-300/300L has one (1) ear cup cushion, one (1) temple pad, and a headband cushion.

To **replace the ear cup cushion**, do the following:

1. Grasp the **worn ear cushion** and carefully pull it **off the ear cup**.
2. Starting at the top of the ear cup, place the **top part of the back flap of the new ear cushion** over the top lip of the ear cup.

   NOTE: The ear cup cushion hole orients to the bottom of the ear cup.

3. Using your fingers, work the **back flap of the ear cushion** around the ear cup.
4. Pull the **bottom of the ear cushion** over the bottom lip of the ear cup.

To **replace the headband cushion**, do the following:

1. Grasp the **headband cushion**.
2. Pull the **worn cushion** off the headband.
3. Remove the **protective paper** from the sticky side of the new headband cushion.

   NOTE: The headband is affixed to the headband with adhesive tape.

4. Align the **new headband cushion** to the headband frame.
5. Firmly press **the new headband cushion** in place.

To **replace the three-cushion version headband cushion**, do the following:

1. Grasp the **headband cushion**.
2. Pull the **old cushion** off the headband.

3. Align the **new top cushion** to the top of the headband.
4. Align the **right side cushion** to the right side of the headband.
5. Align the **left side cushion** to the left side of the headband.
6. Firmly press the **new headband cushions** in place.

To **replace the temple pad cushion**, do the following:

1. Grasp the **temple pad cushion**.
2. Pull the **worn cushion** off.
3. Remove the **protective paper** from the sticky side of the new temple pad cushion.

   NOTE: The temple pad is affixed to the headband with adhesive tape.

4. Align the **new temple pad cushion** to the headband frame.
5. Firmly press **the new temple pad cushion** in place.

Replace the Windscreen

To **replace the wind screen**, do the following:

1. Remove the **worn windscreen** from the microphone and discard.
2. Gently pull the **new windscreen** over the microphone.

Care and Maintenance

Clean the Headset

When cleaning your headset, do the following:

- use a soft, slightly damp cloth (water only).
- if necessary, a mild mix of soapy water may be used.

IMPORTANT: Excessive water can damage the headset and cause short circuits to the electrical components of the unit. Do not use solvents or chemicals when cleaning your headset as it may cause damage or inoperability.

Store/Transport the Headset (MH-402 and MH-402L Only)

For storing or transporting your MH-402/402L headset, use the protective carrying case the headset is shipped in. Place the headset in the carrying case as shown in Figure 16.

FIGURE 16. MH-402/402L in Carrying Case

CHAPTER 3

Battery Module

Battery Module

The battery module is only used with the MH-402 and MH-402L ANR headset/headphone. By using the battery and enabling the ANR, the audio quality is markedly enhanced.

NOTE: The battery charger uses a universal power pack with a mini-USB connector that is compatible with many devices that accept the connector, for example a cell phone.

Replace the Battery

CAUTION: If this is the first time using the batteries, see “Charge the Battery” on page 22.

Batteries can be installed on either ear cup (the left or right).

To **replace a battery module**, do the following:

1. Align the **mounting tab with the mounting tab hole**.
2. Slide the **battery module** into place.
3. Press down on the **battery module**, snapping it into the ear cup.

Charge the Battery

IMPORTANT: Before installing the battery for the first time, charge the battery for at least an hour and a half to ensure a fully charged unit. A fully charged battery lasts approximately 40 hours between charges.

FIGURE 17. Battery Charger Reference Diagram

The battery charger has an LED, shown in Figure 17, that displays two(2) color states:

Green LED – The charger is on.

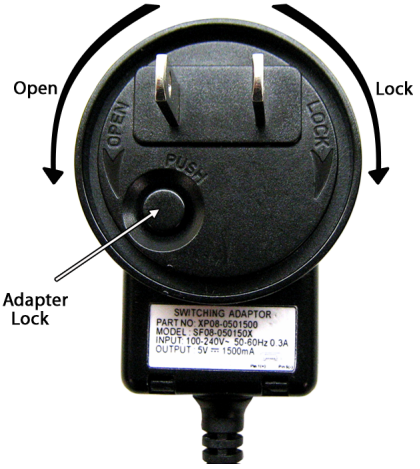
Red LED – The battery is being charged. Once the battery is done charging, the green LED appears.

NOTE: If the battery is damaged and not able to charge or if the battery is fully charged, the red LED does not display.

The power module for the battery charger comes with the US connection adaptor as standard. There are three (3) optional connection adapters (Euro, UK, and Australian), also known as the world adapters.

To **change the connection adapter for the power module**, do the following:

1. While pressing the adapter lock button, turn the **adapter** counter-clockwise to release the adapter.

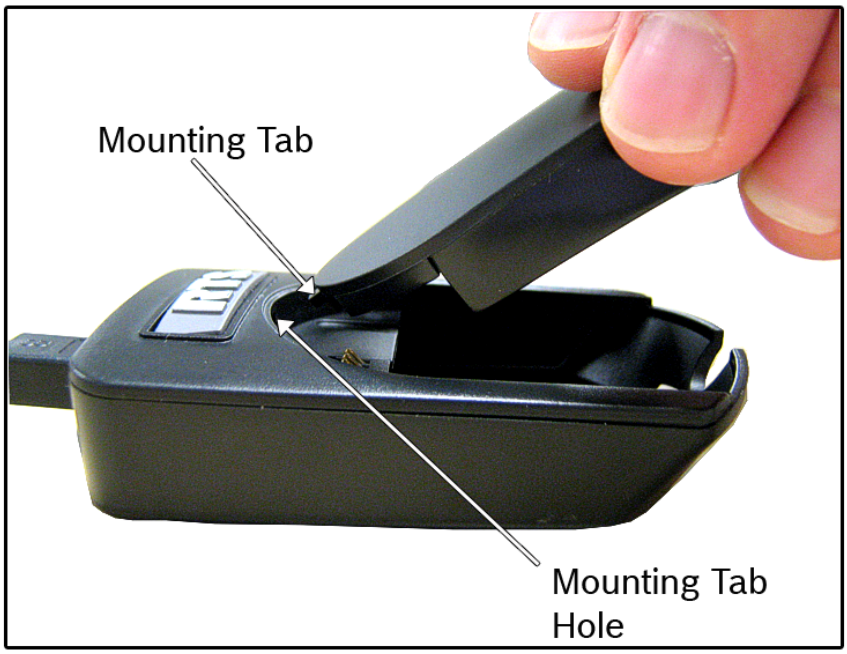


2. Replace the **current adapter** with the desired power module adapter.
3. Turn the **new adapter** clockwise to lock it in place.

To **charge a battery**, do the following:

1. Plug the **power supply** into an electrical outlet.
2. Attach the **power supply** to the charger.
   The LED lights green.

3. Align the **mounting tab with the mounting tab hole** on the battery charger.



4. Slide the **battery module** into place.
5. Press down on the **battery module**, snapping it into the ear cup.
   The LED lights red while the battery is charging, and lights green when it is finished charging.

Connectors

XLR Connectors

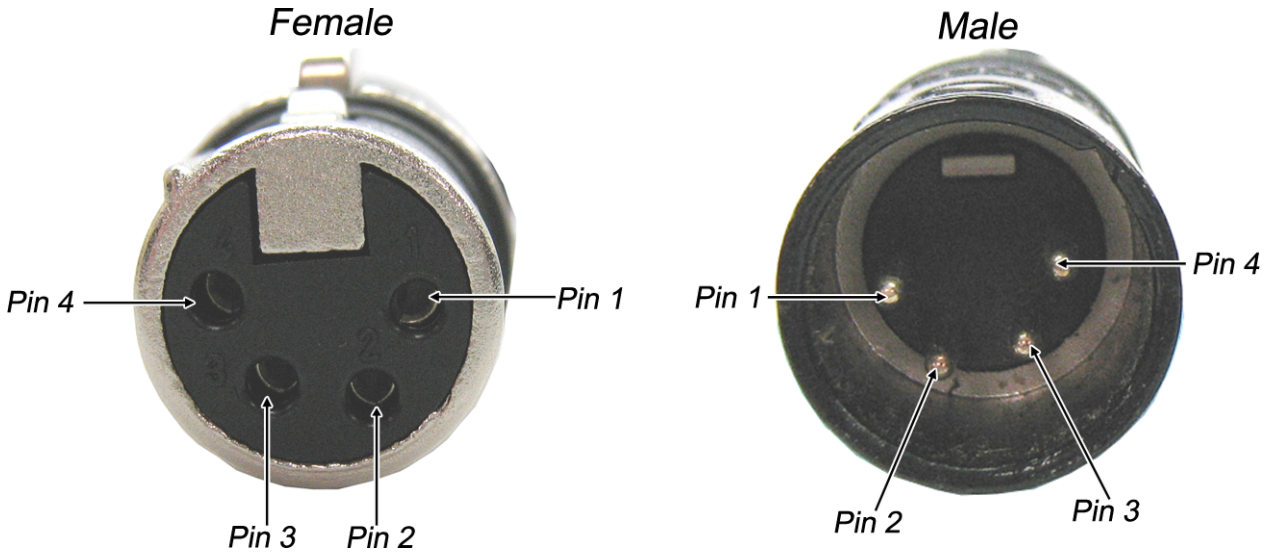


FIGURE 18. 4-Pin XLR Connector Female and Male

TABLE 3. 4-Pin XLR Pin Out

Pin	Wire Color	Description
1	Blue	MIC -
2	White	MIC +
3	Black/Outer Shield	SPK -
4	Yellow/Red	R SPK and L SPK (dual)
Case	Inner Shield	MIC SHIELD

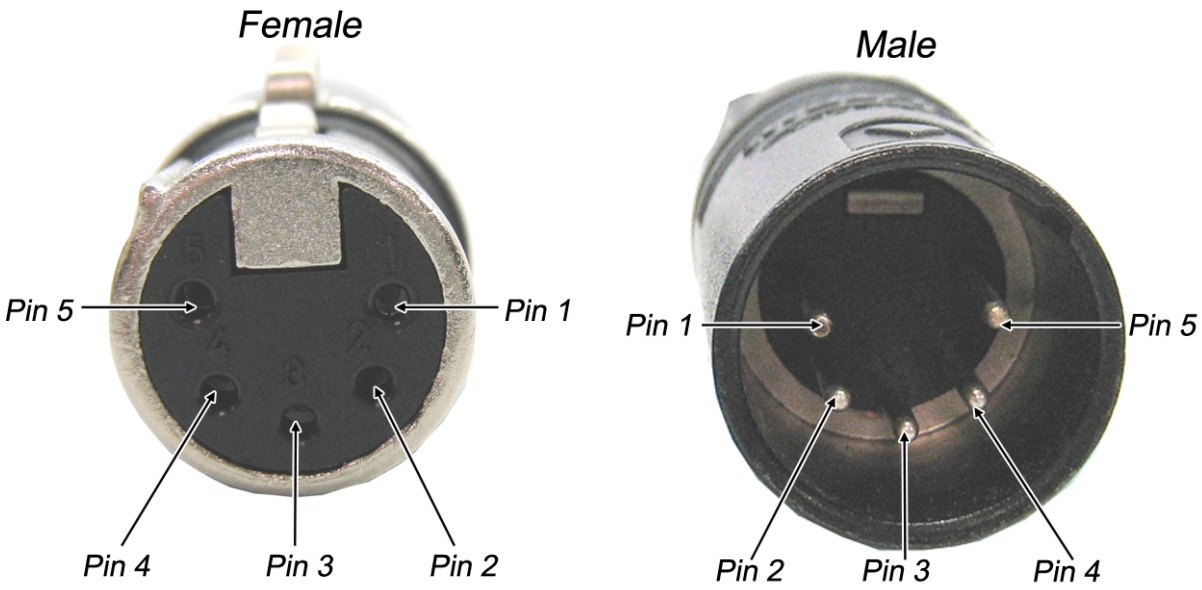


FIGURE 19. 5-Pin XLR Connector Female and Male

TABLE 4. 5-Pin XLR Pin Out

Pin	Wire Color	Description
1	Blue	MIC -
2	White	MIC +
3	Black/Outer Shield	SPK -
4	Yellow	L SPK +
5	Red	N/C (single) R SPK + (dual)
Case	Inner Shield	MIC SHIELD

Pig Tail Connector

Pigtail connectors give you maximum flexibility in the type of connector you want to use. Table 5shows the wire colors and descriptions for the pigtail.

TABLE 5. Pig Tail Connector Pin Out

Description	Color
Speaker Left +	Yellow
Speaker Right +	Red
Speaker -	Black/Outer Shield
Mic +	White
Mic -	Blue/Inner Shield
Power +	Green
Power -	Black/Outer Shield

Quick Disconnect

The **Quick Disconnect** allows you to quickly switch connector types without having to switch headsets, saving time and space when you are on the go.

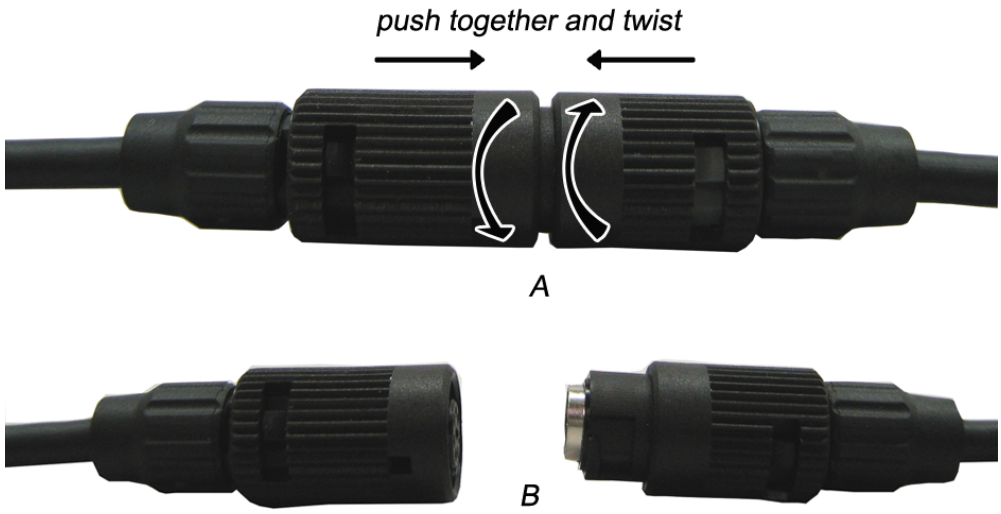


FIGURE 20. Quick Disconnect Connector

To **disconnect the quick disconnect connector**, do the following:

1. Holding the quick disconnect in both hands, gently push **each connector end** toward each other (see Figure 20, A).
2. While pushing toward each connector end, twist the **connector ends** in opposite directions so they unlock.
   The connector comes apart (see Figure 20, B).

To **connect the quick disconnect connector**, do the following:

1. Align the **opposite connector ends**.
2. Gently push **each connector end** toward each other.
3. While pushing toward each connector end, twist the **connector ends** in opposite directions so they lock.

TABLE 6. Quick Disconnect Pin Assignments

Pin	Color	Description
1	Yellow	Speaker Left +
2	Red	Speaker Right +
3	Black	Speaker -
4	White	Mic +
5	Blue/Inner Shield	Mic -
6	Green	Power +
7	Outer Shield	Power -
8	N/C	N/C

CHAPTER 5

Specifications

Specifications

Speaker

Transducer Type ..... Dynamic

Sensitivity ..... 100dB SPL/mW at 1kHz (normal volume setting)

Impedance ..... 150Ω nominal

Frequency Response ..... 100Hz to 10kHz

Distortion ..... <10%

Noise Reduction

ANR Models MH-402 and MH-402L Only ..... up to 12dB noise reduction between 100Hz and 2000Hz

Microphone

Type ..... Noise canceling dynamic

Impedance 200Ω

Sensitivity ..... 200Hz to 5kHz

Distortion ..... <5%

General

Gross Weight MH-300, 8oz (226g); MH-302, 10oz (284g); MH-402, 10oz (284g)

Cord Length 5.9ft. (1.8m)

Color ..... Black

CHAPTER 6

Troubleshooting and FAQs

PROBLEM	*SOLUTION*
Where do I send my headset for repair?	Attn: Customer Service Bosch Communications, Inc. 8601 East Cornhusker Hwy. Lincoln, NE 68507 U.S.A Please include a copy of receipt, if available. Along with the unit, please include your name, billing, and shipping address, telephone number, and a brief description of the problem you are experiencing. Allow 7-10 working days for service, plus transportation time, once we have received the unit for repair/refurbish. For questions about repair, please call customer service at: 800-553-5992
My ANR (Automatic Noise Reduction) Headset is no longer working.	• Verify the ANR switch is in the on position. • Verify the battery is installed properly. • Verify the battery is charged. • Verify the cushions are installed properly. • Verify the headset is on the head properly. • Verify the ear cushions are seated on the ear properly. • If you have verified the previous bullets, then send the unit in for repair.
My headset does not work with my MP3 player.	• Verify the cord for the device is plugged in firmly.

PROBLEM	*SOLUTION*
I need parts for my headset.	• Contact customer service for the part number you are looking for.
How long will it take my headset to be repaired?	Repair duration is usually 7 to 10 working days plus shipping time back to the customer.